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EXAMINER	
MISLEH, JUSTIN P	
ART UNIT	**PAPER NUMBER**
2612	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/408,873	SEEGER ET AL.	
	Examiner	Art Unit	
	Justin P. Misleh	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18, 20, and 25 - 35, 38 - 46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *25 -28, 34, 35, 41, and 42* is/are allowed.

6)☒ Claim(s) *18, 20, 29 - 33, and 38 - 40* is/are rejected.

7)☒ Claim(s) *43 - 46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 6, 2005 has been entered.

Response to Arguments

2. Applicant's arguments filed December 6, 2005 have been fully considered but they are not persuasive.

3. Applicant comments, "microscanning as taught by Chevrette produces an interlaced image with a set of images recorded by moving a lens ... [I]n contrast, Applicant's system and methods produces a composite image with greater pixel resolution by patching together recorded images at regions of overlap."

4. The above-alleged differences between Applicant's claimed invention and Chevrette's microscanning are irrelevant. As previously mentioned (e.g., Final Office, July 1, 2005; Examiner's Answer, October 1, 2005), the combination of Saund in view of Chevrette would yield a plurality of images patched together at regions of overlap, wherein each of the plurality of images capture a different view of a single area and each of the plurality of images would be captured according to the microscanning method of Chevrette. Saund even states in column 3

(lines 16 – 21 and 30 – 35), "image tiles" or "smaller subregions" of the single area "must be captured independently, and then pieced together" and that the "image tiles" will "overlap one another." There is no question that Saund teaches patching the views together at regions of overlap.

5. Applicant additionally comments, "the Office Action of July 2005 took Official Notice with respect 'to simultaneously recording a plurality of images by a plurality of respective cameras' ... without stating how the Official Notice related to Applicant's claimed invention."

6. The Final Office Action (mailed July 1, 2005) clearly indicated that Saund discloses an array (plurality) of cameras (54) capturing a plurality of images (see figure 3 and column 3, lines 22 – 29) and a corresponding image processing system (computer 56) coupled to the plurality of cameras (54) to combine the plurality of camera images recorded to produce a composite image having a higher resolution than the resolution of one or more of the recorded views of the area (see column 3 lines 12 – 53).

7. Moreover, Saund discloses a plurality of cameras for capturing different images of a single area and subsequently processing those images into a composite – Saund is completely silent with respect to the timing of individual image captures. Although, it is highly likely that Saund captures all the images at same time (i.e., simultaneously), it is not explicitly stated. However, the Examiner pointed out, via Official Notice, that capturing a plurality of images using a plurality of cameras at the same, or rather simultaneously is not new. In fact, the Examiner asserts such a feature is notoriously well known and expected in the art. Therefore, the Official Notice taken indeed relates to Applicant's claimed invention. Applicant is reminded support for the Examiner's use of Official Notice is provided in MPEP §2144.03.

Claim Objections

8. **Claims 26 and 28** are objected to because of the following informalities: inconsistencies.

The claim language recites "the offset" therein; however, "the fixed offset" has been previously recited.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. **Claims 18, 20, 29 – 33, and 38 – 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saund (US 5 528 290) in view of Chevrette et al.** The Examiner's responses to arguments above are fully incorporated into these rejections.

11. For **Claims 18 and 29**, Saund disclose, as shown in figures 1 and 3 and as stated in columns 3 (lines 12 – 35) and the abstract, an image acquisition system and a corresponding method (see figure 1), comprising a plurality of cameras (camera subsystem 54 includes a plurality of arrayed cameras) records a plurality of views (see figure 3) an area having one or more objects (blackboard 52 is an object) to produce a plurality of camera images of different portions of the area (62, 64, and 66 of figure 3; also see column 3, lines 40 – 52), each camera (camera subsystem 54) having a lens positioned within a plane substantially orthogonal to an optical axis of the lens (see column 3, lines 30 – 35; As stated, each captured image contains

perspective distortion causes by each camera having an off-axis viewpoint. Therefore, it must be that each camera a lens positioned within a plane substantially orthogonal to an optical axis of the lens), wherein the view of each camera is positioned to record a portion of the area (see figure 3); and

an image processing system (computer 56) coupled to the plurality of cameras (54) and operable to combine the plurality of camera images recorded to produce a composite image having a higher resolution than the resolution of one or more of the simultaneously recorded view of the area (see column 3 lines 12 – 53).

Additionally, it is noted Saund even states in column 3 (lines 16 – 21 and 30 – 35), "image tiles" or "smaller subregions" of the single area "must be captured independently, and then pieced together" and that the "image tiles" will "overlap one another." Therefore, there is no question that Saund teaches patching the views together at regions of overlap.

While Saund discloses an array (plurality) of cameras (54) capturing a plurality of images (see figure 3) to form a high-resolution composite image, Saund does not disclose that images are captured b the cameras simultaneously and wherein at least one of the cameras has an offset lens to produce an oblique field of view of the portion it records of the area and wherein the offset lens of the at least one camera may be shifted to one of a plurality of offsets.

On the other hand, Chevrette et al. also disclose a system and method for generating a high-resolution image. More specifically, Chevrette et al. discloses a method for fast microscanning that uses a movable lens. Figures 1d and 2 disclose the principles of microscanning, which involves moving a lens a distance of a half a pixel pitch to record a microscanned image (e.g., the four single number images in Fig. 1d) and "interlacing" the four

microscanned images to arrive at the final image (e.g., the large image with numbers 1-4 in it). Microscanning has the effect of increasing the spatial resolution (i.e.. reciprocal sampling interval on object plane, e.g. DPI) and the pixel resolution (i.e., number of pixels). In the example in Figure 1d, the four single-number images have a lower spatial and a lower pixel resolution then the final image with numbers 1 – 4. Hence, Chevrette et al. at least teaches capturing an image while the lens of a camera is in an offset position, moving the lens to another offset position and capturing a second image, and continuing to move and capture until all views of an area are captured and then generating a final high-resolution microscanned image.

Therefore, Chevrette et al. does in fact provide (as shown in FIGURE A above) wherein at least one of the cameras has an offset lens to produce an oblique field of view of the portion it records of the area and wherein the offset lens of the at least one camera may be shifted to one of a plurality of offsets. The combination of Saund in view Chevrette et al., would yield an extremely high-resolution image of an area generated from captured image tiles 62 – 66, wherein captured image 62 was captured by one camera of the array using the offset lens microscanning method of Chevrette et al., wherein captured image 64 was captured by another one camera of the array also using the offset lens microscanning method of Chevrette et al., and wherein captured image 66 was captured by another one camera of the array using the offset lens microscanning method of Chevrette et al.

As stated in columns 1 (lines 34 – 67) and 2 (lines 1 – 36) of Chevrette et al., at the time the invention was made, it would have been obvious to one with ordinary skill in the art to include the offset lens microscanning method, taught by Chevrette et al., in the image acquisition

system and method, disclosed by Saund, for the advantage capturing high-resolution low noise images using a robust, inexpensive, and low power configuration.

In regards to simultaneously recording a plurality of images by a plurality of respective cameras, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of simultaneously recording a plurality of images by a plurality of respective cameras are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have simultaneously recorded a plurality of images by a plurality of respective cameras for the advantage of increasing image capturing time so as to reduce processing time and power required for color imagery registration of time-sequenced captured images.

12. As for **Claims 20 and 30**, according to *The American Heritage® Dictionary of the English Language, Fourth Edition*, a mosaic is a composite picture made of overlapping, usually aerial, photographs. Thus, as shown in figures 3 and 8 and as stated in column 3 (lines 16 – 21 and 30 – 35), Saund discloses, the image acquisition system of Claim 18 and method of Claim 29, wherein the image processing system (computer 56) is operable to produce the composite image by mosaicing the camera images.

13. As for **Claims 31 and 38**, Saund discloses, as shown in figure 3 and as stated in columns 3 (lines 16 – 21 and 30 – 35), the image acquisition system of Claim 18 and method of Claim 29, wherein the image processing system (computer 56) is operable to combine the plurality of cameras (camera subsystem 54 including array of cameras) to produce a composite image of the plurality of views by patching the plurality of camera images together at regions of overlap.

14. As for **Claims 32 and 39**, Saund discloses, as shown in figure 1 and as stated in column 3 (lines 22 – 29), that camera subsystem (54) may comprise an array of fixed or rotatable cameras; however, Saund is silent with regard to the housing of the camera subsystem (54) and, likewise, wherein the plurality of cameras are arranged together in a housing.

Albeit, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of arranging a plurality of cameras together in a housing are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have for the advantage of reducing expense, operations and computations required in forming a composite image.

15. As for **Claims 33 and 40**, Saund discloses, as shown in figure 1, wherein the plurality of cameras (54) are positioned over a blackboard (52); however, Saund is silent with regard to positioning the cameras over a desk.

Albeit, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of positioning a plurality of cameras over a desk are well known and expected in the art. At the time the invention was made, it would have been obvious to one with ordinary skill in the art to have for the advantage of reducing vibration and camera shake thereby providing a high-quality image without significant distortion.

Allowable Subject Matter

16. **Claims 25 – 28, 34, 35, 41, and 42** are allowed and **Claims 43, 44, 45, and 46** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. At least for **Claims 34, 41, 43 and 45**, the combination of Saund in view Chevrette et al., which is regarded as the closest prior art, yields an extremely high-resolution image of an area generated from captured image tiles, wherein a first captured image is captured by one camera of the array using an offset lens microscanning method, wherein a second captured image is captured by another one camera of the array also using the offset lens microscanning, and wherein at least a third captured image is captured by another one camera of the array using the offset lens microscanning method. The offset lens microscanning method of Chevrette et al. involves moving a lens a distance of a half a pixel pitch to record a microscanned image.

Therefore, the closest prior art does not teach or fairly suggest wherein at least a second of the plurality of cameras as a fixed offset lens to produce an oblique field of view.

18. As least for **Claim 25**, the combination of Anderson in view Chevrette et al., as previously shown in the Examiner-generated exemplary **Figure A** (see Final Office Action, page 6) would yield an extremely high-resolution panoramic image of an area generated from Image 1, Image 2, and Image 3, wherein Image 1 was captured when the camera is in a first position using the offset lens microscanning method of Chevrette et al., wherein Image 2 was captured when the camera is in a second position also using the offset lens microscanning method of Chevrette et al., and wherein Image 3 was captured when the camera is in a third position again using the offset lens microscanning method of Chevrette et al. As clearly shown in **Figure A**, the lens is offset to offset position 1 in each of Images 1, 2, and 3; the lens is offset to offset position 2 in each of Images 1, 2, and 3; the lens is offset to offset position 3 in each of Images 1, 2, and 3; and the lens is offset to offset position 4 in each of Images 1, 2, 3 (see Chevrette et al. Figure 1d for reference), thereby guaranteeing that the lens is in the same offset position when

the camera is rotated from position to position. The offset lens microscanning method of Chevrette et al. involves moving a lens a distance of a half a pixel pitch to record a microscanned image.

Therefore, the closest prior art does not teach or fairly suggest recording a view while a lens is positioned at a fixed offset position while the camera is at a first rotated position; then rotating the camera to a new position about an axis of rotation parallel to an optical axis of the lens; and then recording a second view while the lens is still positioned at the fixed offset position; and finally combining all the recorded views.

Cited Prior Art

19. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure for the following reasons:

- **US 6,686,956 B1** discloses, as shown in figure 7, a camera utilizing an optical wedge, wherein when the optical wedge is rotated, each sensor captures a different view of a single area such that after all rotations and recorded views, each of the captured images combined to form a higher resolution image.
- **US 6,067,112** discloses, as shown in figure 4B, a rotating camera for capturing different views of a single area, wherein the camera rotates along an axis that parallel to optical axis of the camera lens.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Justin P Misleh whose telephone number is 571.272.7313. The Examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, David L Ometz can be reached on 571.272.7593. The fax phone number for the organization where this application or proceeding is assigned is 571.273.3000.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
February 16, 2006

Examiner: Lin Ye
Technology Division: 2622